

A TAXONOMIC REVISION OF THE GENUS *FARADAYA* F. MUELL. (VERBENACEAE)* IN AUSTRALIA

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Abstract

A taxonomic revision of *Faradaya* in Australia is presented. The following two species are recognised: *F. albertisii* and *F. splendida*. *F. albertisii* is confirmed from Australia. A wide range of material has been examined from Malesia and Oceania.

The affinities and distribution are considered for the genus and each species. A key to the species is provided and a detailed description of each species is supplemented by an illustration.

Taxonomic History of the Genus

The genus *Faradaya* was described by F. Mueller (1865) with one species, *F. splendida*, the type of which came from Queensland. Originally it was placed in the Bignoniaceae, but soon after its publication, Seemann (1865) referred the genus to the "Natural Order Verbenaceae, closely related to *Clerodendrum* and *Oxera*". The family Verbenaceae has been accepted for the genus by all subsequent botanists. Earlier, one *Faradaya* collection from Tonga and another from Fiji were respectively described by Seemann (1862) and Asa Gray (1862) as new species of *Clerodendrum*. In view of their difference from other *Clerodendrum* taxa, Asa Gray (1862) formed for them a new section of the genus namely *Clerodendrum* sect. *Tetrathyranthus* A. Gray. Subsequently, Seemann (1865) recognised both types of the section *Tetrathyranthus* as *Faradaya* species and thus reduced this section to synonymy under *Faradaya*.

Bentham (1870, 1876) divided the family Verbenaceae into different tribes, with *Faradaya* in the tribe Viticeae subtribe Oxereae. The tribe Viticeae was considered the appropriate position for the genus by Durand (1888), Baillon (1891), Bailey (1901, 1913) and Lemée (1943). In 1891, Baillon described one of M. Jacquinto's congeneric collection from Melanesia as a new genus, *Schizopremna*, which was later found congeneric with *Faradaya*. In the same publication, however, he also recorded *Faradaya* as a genus native to Oceania. Both *Schizopremna* and *Faradaya* were later accepted by Briquet (1895) and Junell (1934) as distinct genera. Subsequently, van Steenis (1955) considered *Schizopremna* congeneric with *Faradaya* and reduced the former to synonymy under *Faradaya*.

In 1895, Briquet reclassified the Verbenaceae and upgraded the tribe Viticeae to a subfamily Viticoideae. The latter consisted of four tribes: Callicarpeae, Tectoneae, Viticeae and Clerodendreae, with *Faradaya* in the tribe Clerodendreae. This classification was accepted by Dalla Torre & Harms (1904), H.J. Lam (1919), Junell (1934) and Moldenke (1959, 1971).

Seemann (1865) made detailed comments on the stability of the genus *Faradaya*, and recorded under it 4 species. For many years subsequently, *Faradaya* was considered to be a genus of only one or two species. Bentham (1870) reported it to have 4 species, but in Bentham & Hooker's *Genera Plantarum* (1876) he reduced the number to 2. Baillon (1891) also regarded *Faradaya* as a genus of 2 species, Briquet (1895) recognised 4 or 5, and H.J. Lam (1919) recorded 9. In 1973, Airy Shaw gave the number as 17 species. Recently, Moldenke (1971, 1982, 1983) recorded 23 as the number of specific and infraspecific taxa in *Faradaya*.

*The present treatment of the genus *Faradaya* is the sixth in the series of taxonomic revisions in the family Verbenaceae in Australia (See Munir, 1982, 1984a, 1984b, 1985, 1987).

Australian History of the Genus

Faradaya was for many years thought to be solely represented in Australia by the type species. Moldenke (1959, 1971) recorded *F. papuana* Scheff. from Queensland without citing any collection. This species is endemic to Papua New Guinea. Moldenke's record may have been based on a misidentification of *F. splendida* which closely resembles *F. papuana*. During present investigations, *F. albertisii* F. Muell. has been recorded from Australia for the first time, and consequently 2 species are recognised in Australia. In the past, most *F. albertisii* collections from Australia were misidentified as *F. splendida*.

In the present publication, Briquet's (1895) classification of the Verbenaceae is accepted for the genus.

FARADAYA F. Muell.

Faradaya F. Muell., *Fragm. Phyt. Austral.* 5(1865) 21; Seemann, *J. Bot. Lond.* 3 (1865) 256-258; *Fl. Viti.* (1866) 188; F. Muell., *Fragm. Phyt.* 6 (1868) 153; Benth., *Fl. Austral.* 5 (1870) 69; Benth. in Benth. & Hook. f., *Gen. Pl.* 2 (1876) 1154; F. Muell., *Syst. Cens. Austral. Pl.* 1 (1882) 103; *Sec. Syst. Cens. Austral. Pl.* 1 (1889) 173; Baillon, *Hist. Pl.* 11 (1891) 113; Briq. in Engl. & Prantl, *Nat. Pflanzenfam.* 4, 3a (1895) 173; Bailey, *Qld Fl.* 4 (1901) 1181; Dalla Torre & Harms, *Gen. Siphonog.* (1904) 433; H.J. Lam, *Verbenac. Malay. Arch.* (1919) 228; H.J. Lam & Bakh., *Bull. Jard. Bot. Buitenz. Ser. 3*, 3 (1921) 71; Lemée, *Dict. Descrip. Syn. Gen. Pl. Phan.* 8b (1943) 656; Steenis, *Act. Bot. Neerland.* 4 (1955) 477-478; Mold., *Résumé Verbenac. etc.* (1959) 343, 411; N. Burb., *Dict. Austral. Pl. Gen.* (1963) 125; Balgooy, *Blumea Suppl.* 6 (1971) 200; Mold., *Fifth Summary Verbenac. etc.* 2 (1971) 518, 519, 619, 641, 760; Airy Shaw, *J.C. Willis Dict. Fl. Pl. & Ferns* edn 8 (1973) 454; Baines, *Austral. Pl. Gen.* (1981) 155; Mold., *Phytologia* 51 (1982) 384; *Phytologia* 52 (1982) 20; Mold. in Dassan., *Fl. Ceylon* 4 (1983) 402; Munir in B. Morley & Toelken, *Fl. Pl. Austral.* (1983) 288.

Type species: F. splendida F. Muell., *Fragm. Phyt. Austral.* 5 (1865) 21.

Clerodendron sect. *Tetrathyranthus* A. Gray, *Proc. Am. Acad.* 6 (1862) 50; Benth. in Benth. & Hook. f., *Gen. Pl.* 2 (1876) 1156.

Type species: Clerodendron ovalifolium A. Gray, *Proc. Am. Acad.* 6 (1862) 50; *C. amicorum* Seemann, *Bonplandia* 10 (1862) 249.

Schizopremna Baillon, *Hist. Pl.* 11 (1891) 119; Briq. in Engl. & Prantl, *Pflanzenfam.* 4, 3a (1895) 166; Junell, *Symb. Bot. Upsal.* 4 (1934) 84; Barkley, *List Ord. Fam. Anthoph.* (1965) 76, 166.

Type: S. timorensis Baillon, *Hist. Pl.* 11 (1891) 120.

Climbing shrubs, lianas or (not in Australia) wide-spreading trees. *Leaves* simple, decussate, opposite or (not in Australia) verticillate, mostly petiolate, exstipulate; lamina chartaceous or coriaceous, reticulate-veined, unicostate, the venation rather prominent. *Inflorescence* cymose, the cymes aggregated in terminal corymbose thyse, sessile in the leaf axils or rarely (not in Australia) cauliflorous. *Flowers* large and conspicuous, zygomorphic, bisexual, hypogynous. *Calyx* of 4 fused sepals, campanulate, mostly coriaceous, apically closed when immature, but during anthesis split into 2-4 lobes. *Corolla* of 4 fused petals, zygomorphic, rather large and showy, deciduous, tubular below; tube cylindrical below, gradually broadening above; lobes 4, wide-spreading, subequal, the posterior one wider and with apex entire or emarginate. *Stamens* 4, almost equal or slightly didynamous, exserted, alternate with the corolla-lobes, epipetalous, inserted about the middle of the corolla-tube; filaments filiform, usually villous towards the base; anthers ovate-oblong, 2-lobed, the lobes parallel. *Ovary* bicarpellary, syncarpous, shortly or deeply 4-lobed, 4-locular, with one ovule in each cell, attached to an axile placenta; style filiform, sunken between the ovary lobes, glabrous, with 2 short stigmatic lobes.

Fruit drupaceous, 4-lobed and 4-locular or by abortion reduced to 1-3 large obovate pyrenes, the exocarp fleshy and succulent, the endocarp hard, 1-4-seeded. Seeds exalbuminous.

Number of species: World \pm 18; Australia 2

Derivation of name

The genus is named after Michael Faraday (1791-1867), world famous English Chemist and Physicist, a pioneer in electromagnetic research.

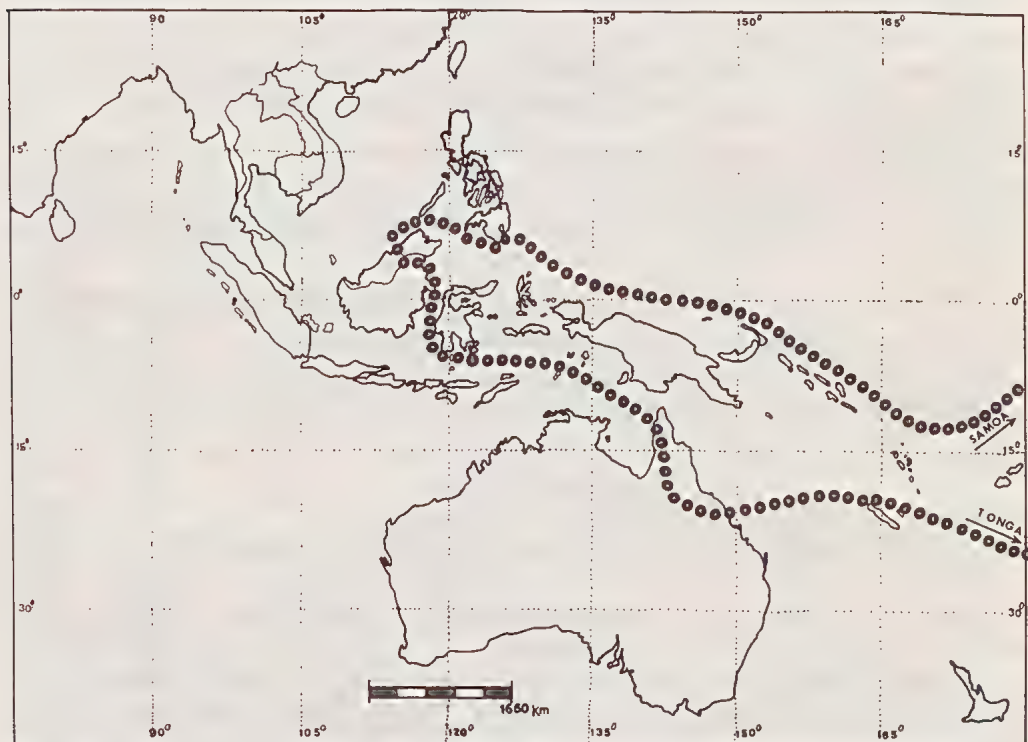
Distribution (Map 1)

The genus *Faradaya* is known to occur in East Malaysia (Sabah), Indonesia, Melanesia, Polynesia, and south to the north-eastern tropics of Australia.

Comments

In the synonymy of this genus, Moldenke (1959, 1971, 1982, 1983) cited "*Tetrathyranthus* A. Gray ex Benth.", giving the impression that Bentham (1876) had raised the status of *Clerodendron* sect. *Tetrathyranthus* A. Gray to that of a genus. In fact, Bentham (1876) only made some comments on the sect. *Tetrathyranthus* while citing it in the synonymy of *Clerodendron*. He did not upgrade it to the genus level.

Under the generic description, H.J. Lam (1919) and Moldenke (1982, 1983) stated that of the four stamens "two are inserted in the upper part and two near the base of the corolla-tube, or sometimes all subequal and all inserted near the apex or near the base of the tube". In the



Map 1. Distribution of the genus *Faradaya* F. Muell.

two Australian species, however, stamens are inserted about the middle of the corolla-tube. Distinctly didynamous stamens have not been found in Australia.

Several *Faradaya* species are cultivated as ornamentals. Of these, *F. splendida* seems the most popular and widely cultivated.

In his comments on this new genus, Seemann (1865) said that "The genus I hold to be a sound one, but Dr Mueller, usually so correct, was, in this instance, certainly wrong, in referring it to Bignoniaceae, with which the plant has nothing to do, it being a genuine member of the Natural Order Verbenaceae, closely related to *Clerodendron* and *Oxera*". After giving short comments on the history of the genus, Seemann (1865) explained the possible reasons which may have led F. Mueller (1865) to refer *Faradaya* to the Bignoniaceae. Seemann states: "The calyx I found to be closed before anthesis and splitting or rather tearing irregularly into 4, 3 or 2 lobes, when the corolla is forcibly pushed through a very narrow aperture at the extreme end, indicated by four very minute points, one would hardly call them teeth, though they are in reality the teeth of the limb of the calyx. The splitting of the calyx is analogous to what we find in the genus *Tecoma* (as now circumscribed) and several genera of *Eubignoniaceae*; we have nothing like it in the *Clerodendrons*; and, I think, there can be no doubt that this set of plants must constitute a separate genus".

Affinities

Faradaya shows closest similarities to *Clerodendrum* by its inflorescence being cymose and centrifugal; flowers (especially the corollas) more or less zygomorphic; stamens 4; fruit drupaceous; drupes composed of four (or through abortion less numerous) 1-locular pyrenes. Nevertheless, *Faradaya* can easily be distinguished by its calyx, which is closed before anthesis, with a more or less long and subulate apex, and splits into 2 or 3 lobes when mature. According to Seemann (1865), *Faradaya* is closely related to *Clerodendrum* and *Oxera*. Bentham (1870) states that "the nearest affinity of the genus appears to be with the New Caledonian *Oxera*". With the exception of stamen number, all other characters common to *Faradaya* and *Clerodendrum* are also common to *Oxera*. The last, however, may easily be identified by its 4- or 5-toothed or 4- or 5-partite calyx and only 2 fertile stamens.

Ewart & Rees (1912) claim that *Huxleya* is related to *Faradaya* but differs in having a 5- (instead of 2-) lobed calyx, a 5- (instead of 4-) lobed corolla, equal (instead of didynamous) stamens, and a 2- (rather than 4-) lobed ovary, as well as being only a foot high upright herb (rather than woody climbers), having solitary flowers instead of their being in terminal panicles, and in having only small linear leaves. Beer & Lam (1936) point out that *Faradaya* has a similar liana-like habit of *Archboldia*. Hooker (1891) says that "the genus is closely allied to *Vitex*, differing chiefly in the spathaceous 2-lobed calyx and the lobed ovary".

The somewhat gynobasic style seems to indicate a close affinity between *Faradaya* and several genera in the Lamiaceae (Labiatae) and Boraginaceae.

Key to the Species

- 1a. Inflorescence only axillary, dense, shorter than the subtending leaves 1. *F. albertisii*
- b. Inflorescence only terminal or both axillary and terminal, lax, longer than the subtending leaves .. 2. *F. splendida*

1. *Faradaya albertisii* F. Muell., Descr. Notes Papuan Pl. VIII (1886) 46; Schumann in Schumann & Hollr., Fl. Kais. Wilh. Land (1889) 122 in obs.; Pulle in Lorentz, Nov. Guin. Ser. 1, 8 (2) (1910) 402 & ibid. 8 (4) (1912) 686; H.J. Lam, Verbenac. Malay. Arch. (1919) 230; H.J. Lam & Bakh., Bull. Jard. Bot. Buitenz., Ser. 3, 3 (1921) 71, pro syn.; Mold., Known Geogr. Distrib. Verbenac. edn 2 (1949) 149; Résumé Verbenac. etc. (1959) 201; Sen & Nasker, Bull. Bot. Surv. India 7 (1965) 45; Mold., Résumé Suppl. 15 (1967) 15; Fifth Summary Verbenac. etc. 1 (1971) 336; Phytologia Mem. 2 (1980) 326; Phytologia 51 (1982) 391.

Lectotype: *D'Albertis s.n.*, on the Fly River, Papua New Guinea, 1876 (MEL 98045!, lectotype designated here; MEL 98046 & MEL 98047 — isolectotypes!).

Typification

F. albertisii is based on D'Albertis' (s.n.) collection from near the Fly River in Papua New Guinea, consisting of at least three duplicates. All duplicates are preserved in Herb. MEL and were annotated by F. Mueller and certainly used by him in preparing the original description of this species. Since he did not select a specimen as a holotype, it is proposed to designate a lectotype for this name. Of all the available syntypes, the one numbered MEL 98045 is the best representative of this species and is chosen here as the lectotype.

Description (Fig. 1)

A tall climbing shrub or shrubby vine, 3-15 m tall. *Stem* cylindrical, 20-50 mm diam., greyish-brown, the young parts at first sparingly puberulous, later glabrescent. *Leaves* petiolate; lamina oblong, narrowly ovate, ovate-oblong or ovate-elliptic, (8-) 11-20 (-30) cm long, (4-) 6-12 (-18.5) cm wide, chartaceous to subcoriaceous, glabrous but not shiny, pale-green below, basally rounded or cordate, apex acuminate, margin entire, often with flat orbicular glands near the base; main pairs of nerves 6-10, very prominent beneath; petioles 10-55 (-100) mm long, glabrous. *Inflorescence* a dense axillary thyse, 5-15 cm long, 5-11 cm wide; cymes shorter than the subtending leaves; primary lateral peduncles 10-25 (-50) mm long. *Flowers* pedicellate, strongly scented; pedicels (3-) 5-12 mm long. *Calyx* yellowish-green, 15-25 mm long, glabrous, before expanding (i.e. in bud) apically pointed in horn-like fashion, divided to the middle or to the base when full grown; lobes semi-lanceolate, acuminate, sometimes with a few sparsely scattered large external glands. *Corolla* white, glabrous, infundibular; lobes obovate or elliptic-obovate, the large adaxial lobe apically rounded, the remaining three deeply emarginate or bilobed, 15-20 (-23) mm long, 10-16 (-20) mm wide; tube slender, funnel-shaped toward the top, 25-35 mm long. *Stamens* exserted, scarcely didynamous, inserted about the middle of the corolla-tube; filaments white, filiform, villous-papillose towards the base, glabrous above, (35-) 40-50 (-60) mm long; anthers oblong-ellipsoid, 3-4 mm long, with 2 parallel lobes free in the lower half. *Ovary* globular, 4-furrowed, densely grey-tomentose, 2-3.5 mm diam.; style exserted, white, filiform, glabrous, 45-70 mm long, with shortly bifid stigma. *Fruit* not seen but other sources indicate the size as "76 mm x 51 mm x 51 mm".

Representative specimens (collections seen: Australian 13, non-Australian 20)

AUSTRALIA: QUEENSLAND: *Bell 679*, 11.4 km NE of Tinaroo Dam bridge on Danbulla Forest Drive, 12.x.1982 (AD). *Blake 9723*, West of Kennedy, 27.ix.1935 (BRI). *Chapman A 126*, Kuranda Range, between Cairns and Kuranda, 26.viii.1972 (JCT). *Fitzsimon 297*, State Forest Reserve 185 opposite Fire Tower, 31.x.1978 (AD, QRS). *Fraser s.n.*, Atherton Tableland, undated (BRI). *Cooke 209*, Murray Upper, 16.xi.1977 (JCT). *Jones 766*, Dunbulla, 21.ix.1957 (JCT). *Kajewski 1293*, Lake Barrine, Atherton Tableland, 29.x.1929 (BRI). *Stocker 951*, State Forest Reserve 700, Gillies Highway, 18.x.1972 (QRS). *Whiting s.n.*, Atherton, 23.x.1935 (BRI). *Williams 206*, 21 km from Ravenshoe, Ravenshoe-Millaa Millaa Road, 10.x.1968 (BRI). *Williams 215*, 1.6 km from Bramston Beach, 16.x.1968 (BRI). *Wrigley 249*, Iron Range (Kennedy) Road, between Tozer's Gap and turnoff to Iron Range Airfield, 6.ix.1976 (CBG).

PAPUA NEW GUINEA: *Armit s.n.*, Mt Dayman, New Guinea, 1894 (MEL). *Bäuerlen s.n.*, Thickland River, New Guinea, 1885 (MEL). *Brass 7442*, Fly River, 48.28 km above D'Albert Junction, Papua, Aug. 1936 (A, BRI). *Brass 8200*, Lower Fly River, east bank opposite Sturt Island, Papua, Oct. 1936 (A, BRI). *Carr 11594*, Veiya, Papua, 8.iii.1935 (CANB). *Gillison NGF 22481*, Alimbit River, Kandrian sub-district, West New Britain, 8.x.1965 (BRI, L, LAE). *Hartmann s.n.*, loc. incert., New Guinea, 1887 (MEL). *Hoogland & Craven 10125*, along Sepik River near Ambunti, New Guinea, 24.v.1966 (A, CANB, K, L, LAE). *Hoogland & Womersley 3243*, c. 2 km NE of Sangara homestead, North Div. Terr. of Papua, 8.vii.1953 (BRI, CANB). *Millar NGF 14606*, Tuamina River, Lae-Wau Road, Morobe District, New Guinea, 14.viii.1962 (BRI, CANB, LAE). *Millar NGF 23526*, c. 20 km from station, Northern District, Papua, 22.vii.1964 (BRI, CANB, L, LAE). *Millar NGF 35136*, Amboin, Angoram subdistrict, New Guinea, 28.vii.1967 (A, BRI, CANB, L, LAE). *Saunders 560*, Ramu Valley, Madang subdistrict, New Guinea, 3.viii.1955 (BRI, CANB). *Streimann & Lelean NGF 18437*, Oriomo River, Daru subdistrict, Papua, 20.ix.1972 (BRI, CANB, L, LAE). *Turner 76*, Fife Bay, Papua, Aug. 1930 (BRI). *Womersley 3757*, Sepik River near Yesan, New Guinea, 4.ix.1949 (BRI, CANB, LAE).



Fig. 1. *Faradaya albertisii* F. Muell. (A-E, G.C. Stocker 951:QRS; F, K. Williams 215:BRI). A, habit drawing of a branch; B, flower vertically cut open to show androecium and gynoecium; C, calyx split into 2 lobes during anthesis; D, ovary; E, transverse section of ovary; F, fruit.

IRIAN JAYA: *Brass* 13918, Bernhard Camp, Idenburg River, -iv.1936 (A, BRI). *Djamhari* 378, Sorong Kp. 27.vii.1948 (BRI). *Pleyte* 478, Sorong, 5.viii.1948 (A, BO, K, L).

Distribution (Map 2)

In Australia, *F. albertsii* is found only in the northern tropical areas of Queensland, where the major distribution is to the south and south-west of Cairns, chiefly on the Atherton Tableland. In addition, one locality is to the north of Cairns near Kuranda, and another one further north around Iron Range mining area. Throughout its distribution range in Australia, *F. albertsii* seems to overlap its nearest ally *F. splendida* F. Muell.

Collections from overseas have been examined from Papua New Guinea, New Britain and Irian Jaya.

Comments

The occurrence of *F. albertsii* in Australia is confirmed. Its presence in "tropical Australia" was mentioned by H.J. Lam (1919) but no specimen was cited. All Australian collections of *F. albertsii* had previously been identified as *F. splendida* F. Muell.

H.J. Lam (1919) and Moldenke (1982) described the stamens as "distinctly didynamous", with two being inserted near the base and two at the middle of the corolla-tube. During present studies, however, the stamens of several specimens examined (including the types) were found to be almost equal or very slightly unequal. Their insertion in the corolla-tube is invariably about the middle.



Map 2. Distribution of *F. albertsii* ○ *F. splendida* ●

H.J. Lam (1919) and Moldenke (1982) state that the corolla is "internally papillose-pilose near the stamen insertion". Amongst the many specimens examined by the present author, villous hairs were found only on the basal parts of the filaments and not in the corolla-tube, and were never reduced to papillae.

Flat orbicular glands on the lamina are somewhat similar to those found in *Gmelina dalrympleana* (F. Muell.) H.J. Lam and *Gmelina schlechteri* H.J. Lam. The glands in *F. albertisii*, however, are smaller, less conspicuous and not restricted to the base of the lamina.

The type of this species was collected from Papua New Guinea by Count Luigi Maria d'Albertis (1841-1901) in whose honour it is named.

Affinities

F. albertisii is very similar to *F. splendida* F. Muell. and *F. papuana* Scheff. by its leaves being regularly decussate-opposite, glabrous; inflorescence and flowers of the same general aspect; stamens and style exserted; filaments villous towards the base; fruit ovoid-ellipsoid, creamish-white, about the shape and size of a hen's egg. Nevertheless, *F. albertisii* may easily be distinguished by its inflorescence which is strictly axillary and shorter than the subtending leaves.

According to F. Mueller (1886), "this species is closely akin to *F. splendida*; the petioles are however thicker, the leaves of a firmer texture with stronger nervation and venation and also with a longer and more pointed terminal protraction, and they are not shining; the stalks and stalklets of the flowers are much shorter, by which means the inflorescence becomes very contracted; the bud of the calyx is longer and acutely pointed; perhaps the fresh flowers and ripe fruits may exhibit other marks of discrimination. A comparison should still be instituted with *F. papuana* from Andaj, described by the lamented Dr Scheffer on p. 42 in the *Annales du jardin botanique de Buitenzorg*, volume premier; but in the narrow acumination of the leaves is not alluded to, while according to Dr Scheffer's description the petioles of this plant are longer, the flowers larger, and the stamens inserted lower on the corolla-tube. He records simultaneously the interesting observation, that sometimes all four of the large distinct fruitlets become developed".

H.J. Lam (1919) comments under *F. ternifolia* F. Muell. that *F. splendida* and *F. albertisii* show some affinities to that species.

2. *Faradaya splendida* F. Muell., *Fragm. Phyt. Austral.* 5 (1865) 21; Seemann, *J. Bot. Lond.* 3 (1865) 257 & 258; Seemann, *Fl. Viti.* part 5 (1866) 190; F. Muell., *Fragm. Phyt. Austral.* 6 (1868) 153; Benth., *Fl. Austral.* 5 (1870) 69; Seemann, *Fl. Viti.* (1873) 441; F. Muell., *Descr. Notes Papuan Pl.* 6 (1875) 47 & 48; *Syst. Cens. Austral. Pl.* 1 (1882) 103; *Sec. Syst. Cens. Austral. Pl.* 1 (1889) 173; Schumann in Schumann & Holtr., *Fl. Kais. Wilh. Land* (1889) 122; Hook. f., *Curtis Bot. Mag.* 117 (1891) t. 7187; Warb., *Bot. Jahrb.* 18 (1894) 209; Schumann in Schumann & Lauterb., *Fl. Deutsch. Schutzgeb. Südsee* (1900) 524; Bailey, *Compreh. Cat. Qld Pl.* (1913) 385 & 386, fig. 363; H.J. Lam, *Verbenac. Malay. Arch.* (1919) 234, excl. syn. *F. papuana* Scheff.; H.J. Lam & Bakh., *Bull. Jard. Bot. Ser. III*, 3 (1921) 71, excl. syn. *F. papuana* Scheff. & *F. albertisii* F. Muell.; H.J. Lam, *Bot. Jahrb.* 59 (1924) 94, excl. syn. *F. papuana* Scheff. & *F. albertisii* F. Muell.; H.J. Lam & Bakh., *Nova Guinea* 14 *Bot.* 1 (1924) 169; Bakh., *J. Arnold Arb.* 10 (1929) 72; Junell, *Symb. Bot. Upsal.* 4 (1934) 109, fig. 173; Webb, *Bull. Sci. Indust. Res. Org. Melbourne* 241 (1949) 53; Mold., *Résumé Verbenac. etc.* (1959) 194, 195, 201, 202, 209; Burkill, *Dict. Econ. Prod. Malay Penins.* 1 (1966) 1013; Corner & Watanabe, *Illustr. Guide Trop. Pl.* (1969) 760; Mold., *Fifth Summary Verbenac. etc.* 1 (1971) 324, 333, 336, 338, 346, 363; *Phytologia* 28 (1974) 449; Lord, *Trees Shrubs Austral. Gard.* edn 5 (1982) 322, fig. 594; Mold., *Phytol. Mem.* 2 (1980) 315, 323, 326, 328, 336, 353, 547; *Phytologia* 52 (1982) 36.

Lectotype: *J. Dallachy s.n.*, Rockingham Bay, Queensland, Australia, undated (K, lectotype designated here!; MEL 583466-583468, isolectotypes!).

F. matthewsii Merr., J. Roy. Asiat. Soc. Sing. 76 (1917) 115; Bibl. Enum. Born. Pl. (1921) 515; Fedde & Schust., Justs Bot. Jahresber. 47 (1927) 245; Mold., Known Geogr. Distrib. Verbenac. etc. edn 2 (1949) 145, 185; Résumé Suppl. 3 (1962) 24; Fifth Summary Verbenac. etc 1 (1971) 324; Phytologia Mem. 2 (1980) 315; Phytologia 52 (1982) 22.

Type: *A. Villamil 253*, in ravines at an altitude of about 12 m, at Sandakan, Sabah, East Malaysia, Sept.-Oct. 1916 (K!, PNH n.v., probably destroyed in World War II — syntypes).

Typification

F. splendida is based on an unnumbered J. Dallachy collection consisting of at least 4 duplicates, all of which were annotated by F. Mueller and certainly used by him in preparing the original diagnosis of this species. Since he did not choose a specimen as a holotype, it is proposed to select a lectotype for this name. Of all the available syntypes, a duplicate in Herb. K is particularly complete and well preserved and chosen here as the lectotype.

Description (Fig. 2)

A strong-growing woody climber (1.5-) 3-15 (-20) m high. *Stem* pale-brown; branchlets minutely puberulous when young, eventually glabrescent. *Leaves* petiolate; lamina ovate, oblong-elliptic to subrotund, with acuminate, acute or sometimes subobtusate apex, rounded or cordate at the base, entire, (8-) 10-32 (-41) cm long, (3-) 5-12 (-15) cm wide, glabrous, sometimes minutely pubescent on the veins beneath, chartaceous or subcoriaceous, pale to dark-green and glossy above; petiole (1.5-) 3-7 (-8) cm long, minutely puberulous when young, later glabrous. *Inflorescence* lax terminal thyrses, 9-28 cm long, 7-25 cm wide, glabrous; primary lateral peduncles 2.5-7 (-11) cm long. *Flowers* pedicellate, large, showy, fragrant; pedicels 3-15 mm long. *Calyx* pale-green, 15-25 mm long, before expanding obovoid and acuminate, later dividing to about the middle into 2 acute or acuminate lobes, glabrous, sometimes externally minutely puberulous, with a few large external glands. *Corolla* white or greenish-white, glabrous, 4-lobed in the upper half, tubular below; lobes elliptic-oblong or oblong-obovate, flat, often deeply emarginate or somewhat bilobed at the top, 12-25 mm long, 6-15 (-20) mm wide; tube slender, funnel-shaped, 20-40 mm long. *Stamens* exserted, scarcely didynamous, inserted about the middle of the corolla-tube; filaments white, filiform, villous towards the base, 35-65 mm long; anthers oblong-ellipsoid, 3-4 mm long, with 2 parallel lobes free in the lower half. *Ovary* globose, 4-furrowed, densely tomentose, 4-lobed, 3-5 mm diam.; style exserted, filiform, glabrous, occasionally sparsely puberulous in the lower half, 50-78 mm long, with minutely bifid stigma. *Fruit* creamish-white, 2-4-lobed, ovoid-ellipsoid, 50-70 mm long, 30-55 mm diam., glabrous, composed of 4 (sometimes 1-3 by abortion) basally connate pyrenes, each one-seeded.

Representative specimens (collections seen: Australian 50, non-Australian 10)

AUSTRALIA: QUEENSLAND: *Archer 3*, Johnston River, 4.x.1949 (BRI). *Bailey s.n.*, Mulgrave River, undated (BRI). *Bellenden Ker Exped. s.n.*, Bellenden Ker Range, 1904 (BRI 266886, NSW 145031). *Birch 70*, Copper Lode Falls Dam area, Cairns, 7.xii.1972 (BRI). *Brass 19757*, Archer River, Wenlock - Coen Road, 31.vii.1948 (A, CANB). *Cooke 85*, Murray Upper, 21.vi.1977 (JCT). *Cooke 136*, Dingo Pocket, Tully River, 28.i.1977 (JCT). *Cooke 150*, Bilyana, 29.i.1977 (JCT). *Dallachy s.n.*, Rockingham Bay, 3.ix.1867 (MEL 98062). *Donahue 8*, Cardwell Range, near lookout, -viii.1974 (JCT). *Eaton s.n.*, Herbert River, undated (BRI 266833). *Farrell 106*, Dunbulla, State Forest Reserve 185, 14.x.1971 (QRS). *Fitzsimon 206*, State Forest Reserve 755, Gosschalk L.A. EP/34, 30.xi.1976 (QRS). *Gittins 2143*, Whitfield Range Road, Cairns, 23.viii.1970 (BRI, NSW). *Hunt 2*, Kuranda, -xi.1939 (BRI). *Irvine 987*, Forest and Timber Bureau, Atherton, 9.x.1974 (BRI, QRS). *Jacks s.n.*, Clump Point, E. of Tully, 14.ix.1985 (AD). *Jones 2833*, Clump Point, El Arish, 14.vii.1964 (CANB). *Jones 3895*, Gadgarra, Atherton, 31.viii.1968 (CANB). *Kelly s.n.*, Lake Barrine, undated (BRI 266888). *Sayer s.n.*, Russell River, 1886 (MEL 98065). *Smith 11882*, Upper Massay Creek, ENE of Coen, 13.x.1962 (BRI). *Smith & Tracy 6570*, Boonjie, west of Mt Bartle Frere, 1962 (BRI, CANB). *Thurston 623*, Tarzali, 21.vii.1944 (QRS). *Unwin 678, 679*, Claudie River, 22.vii.1978 (QRS). *Webb & Tracy 9361*, Rocky River on eastern foot hills of McIlwraith Range, x.1969 (BRI, CANB). *Whaite 3612*, Musgrave River, 25.viii.1979 (NSW). *White s.n.*, The Dirran, -i.1918 (BRI 266880). *Wrigley 413*, Tozer Range, ridge running



Fig. 2. *Faradaya splendida* F. Muell. (A-F, B.R. Jackes s.n.:AD). A, flowering branch; B, flower vertically cut open showing androecium and gynoecium in one half only; C, calyx split open into 2 lobes during anthesis; D, ovary, E, transverse section of ovary; F, fruit.

between upper reaches of Yarraman and Dick Creeks, Cape York Peninsula, 15.ix.1976 (CBG).

PAPUA NEW GUINEA: *Brass* 7770, Lake Daviumbu, Middle Fly River, Papua, -ix.1936 (A, BRI, LAE). *Henty & Sayers NGF* 20530, Gurumbu, Madang District, New Guinea, 3.viii.1964 (BRI, CANB, L, LAE). *Kanis* 1081, c. 12 km N of Amazon Bay, Central District, 24.vi.1969 (A, BO, BRI, CANB, CHR, K, L, LAE, US). *Millar NGF* 35136, Amboin, Angoram subdistrict, East Sepik District, 28.vii.1967 (A, BRI, CANB, L, LAE). *Millar NGF* 48608, Brown River, Port Moresby subdistrict, Papua, 12.viii.1970 (A, BO, BRI, CANB, K, L, LAE, SING, NSW).

INDONESIA: *H.J. Lam* 3342, Karakelong, Talaud Island, 4.vi.1926 (BO).

EAST MALAYSIA: *A. Villamil* 253, at Sandakan, Sabah, -ix.-x.1916 (K, syntype of *F. matthewsii* Merr.).

Distribution (Map 2)

In Australia, *F. splendida* is restricted to the northern tropics of Queensland. The major distribution is on Atherton Tableland and its surrounding areas, chiefly between Cairns and Ingham. Further north, the distribution on Cape York Peninsula has been recorded between Claudie River and Morehead River.

Collections from overseas have been examined from Papua New Guinea, Sabah and Talaut Islands. In addition to the above distribution range, Moldenke (1959, 1971) recorded this species from Irian Jaya, Japen Island, Aroe Island and the Celebes in Indonesia, and from New South Wales, Australia. The occurrence of this species in New South Wales has not been confirmed.

Comments

F. splendida is widely cultivated outdoors for ornament in tropical parts of both hemispheres and in greenhouses elsewhere. In Australia, it has been cultivated in the Botanic Gardens or nurseries in Brisbane, Cairns and Sydney. From overseas, cultivated material has been examined from Botanic Gardens at Lae and Singapore. In addition, Moldenke (1959, 1971) recorded its cultivation in Malaya, India, England, Dominica and Puerto Rico.

Regarding natural distribution within Australia, Moldenke (1959, 1971) reported this species from New South Wales. In support of this, Moldenke (1982) cited an un-numbered Cambage collection from "Fort of Bellerden" which could be an incorrect spelling of Bellenden Ker in Queensland and agree with the present range of distribution.

H.J. Lam & Bakhuizen (1921) regarded *F. albertisii* F. Muell., *F. matthewsii* Merr. and *F. papuana* Scheff. as synonyms of *F. splendida*. During the present investigation, only *F. matthewsii* has been considered synonymous with *F. splendida*. Of the other two, *F. albertisii* is distinct by its strictly axillary inflorescence, and *F. papuana* by its elliptic obtuse leaf-blades, crowded inflorescence and short pedicelled (up to 4 mm long) flowers.

Material of *F. splendida*, however, has been misidentified and distributed to some herbaria as *F. papuana*. Moldenke's (1959, 1971) records of *F. papuana* from Queensland were possibly based on such misidentifications of *F. splendida*. So far, *F. papuana* is not known to occur in Australia.

F. splendida is popularly called "Buku" or "Fragrant Faradaya".

Affinities

F. splendida is very similar to *F. papuana* in its inflorescence being terminal only or both axillary and terminal; leaves regularly decussate-opposite; stamens indistinctly or not at all didynamous; leaf-blades with several prominent discoid glands near the base beneath. In *F. papuana*, the inflorescence is dense; branches densely puberulent, pedicels only to 4 mm long, calyx only 16-20 mm long during anthesis, corolla-lobes only to 5 mm wide, and leaf-blades usually more narrowly ovate or elliptic, basally rounded, truncate or subcordate and apically obtuse. *F. splendida* has several characters common with *F. albertisii*. For detail see "affinities" under *F. albertisii*.

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Index to Scientific Names

Names

New names and combinations are in **bold**. Synonyms, misapplied, misspelt, illegitimate or invalid names are in *italics*.

Page numbers

Page numbers in **bold** refer to the main taxonomic treatment. Page numbers asterisked refer to figures and maps.

Archboldia 168
 BIGNONIACEAE 165
 :EUBIGNONIEAE 168
 BORAGINACEAE 168
Clerodendron 167, 168
C. amicorum 166
C. ovalifolium 166
C. sect. TETRATHYRANTHUS 165, *166*, 167
Clerodendrum 165, 168
Faradaya 165, **166**, 167*, 168, 175, 176
F. albertisii 165, 166, **168**, 169, 170*, 171*, 172, 175
F. matthewsii 173, 175
F. papuana 166, 172, 175
F. splendida 165, 166, 168, 171*, 172, 173, 174*, 175, 176
F. ternifolia 172
Gmelina dalrympleana 172
G. schlechteri 172
Huxleya 168
 LABIATAE 168
 LAMIACEAE 168
Oxera 165, 168
Schizopremna 165, *166*
S. timorensis 166
Tecoma 168
 VERBENACEAE 165, **166**, 176
 :CALLICARPEAE 165
 :CLERODENDREAE 165
 :OXEREAE 165
 :TECTONEAE 165
 :TETRATHYRANTHUS 167
 :VITICEAE 165
 :VITICOIDEAE 165
Vitex 168